

**REMARKS**

The June 24, 2008 Office Action has been carefully studied and reviewed. Claims 1-10 stand rejected. Based on the amendments and remarks made herein, Applicant respectfully submits that the present application is in condition for allowance. Action to that affect is respectfully requested.

**35 U.S.C. §102(b) Rejections of Claims 1 and 3**

Claims 1 and 3 stand rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 3,904,838 (Stewart). Claims 1 and 3 are directed to a line driver and receiver circuit having various components which are interconnected in a specific manner. To anticipate claims 1 and 3, Stewart must disclose all of the claim elements, **arranged as in the claimed invention**. *C.R. Bard, Inc. v. M3 Systems, Inc.*, 157 F.3d 1340 (Fed. Cir. 1998) (emphasis added). Otherwise, the claims are not anticipated.

Claim 1 recites a line driver having output terminals connected to a load and a line receiver having input terminals connected to the same load. The Examiner fails to identify which components of Stewart's voice repeater 110 the Patent Office considers to be a line driver and a line receiver. In fact, the Office Action only identifies the load 188 in Stewart. This is perplexing given each of the amplifier components shown in Figure 2 of Stewart have only a single input terminal and a single output terminal even though the claimed line driver has multiple output terminals and the claimed line receiver has multiple input terminals. Thus, Stewart cannot anticipate claim 1.

In addition, claim 1 recites that the line driver output terminals are connected to the load via equal first impedances and the line receiver input terminals are connected to the load via equal first resistors. However, Figure 2 of Stewart shows no impedance located between line transformer 132 and amplifier 140 or between line transformer 182 and amplifier 170. To the

contrary, Stewart's line transformer 132 is directly coupled to amplifier 140 and line transformer 182 is directly coupled to amplifier 170, failing to meet the express language of claim 1.

Claim 1 further recites that the first impedances are of an impedance value that is much smaller than the impedance value of the load impedance. Stewart fails to teach or suggest this claim feature. The Office Action refers to col. 4, line 57 to col. 5, line 24 in Stewart. Yet, this section of Stewart fails to disclose coupling the output terminals of a line driver to a load with impedances that have a value much smaller than the impedance value of the load as required by claim 1.

Moreover, claim 1 includes transconductance amplifiers that sense the voltage across the first impedances and supply corresponding currents to respective ones of the line driver input terminals. The Examiner argues that the frequency controlled amplifiers 150 and 152 disclosed in Stewart perform this claim feature. Applicant respectfully disagrees. First, the Examiner has failed to identify what the Patent Office considers to be a line driver in Stewart. Second, the output of frequency controlled amplifier 150 is supplied to a T-impedance network for ensuring a particular frequency relationship between the signal output by amplifier 170 and the signal output by amplifier 150, enabling signal cancellation to take place over a desired frequency band. See col. 5, lines 5-15 in Stewart. Frequency controlled amplifier 152 performs a similar function, but in the other direction. See col. 6, lines 16-27 in Stewart. Thus, Stewart's frequency controlled amplifiers 150 and 152 do not sense the voltage across impedances and supply corresponding currents to input terminals of a line driver as claimed. In contrast, Stewart's frequency controlled amplifiers 150 and 152 perform frequency compensation at the output of amplifiers 150 and 152.

For the reasons stated above, Stewart fails to teach or suggest many of the features recited in claim 1. Similar features are recited in claim 3. Accordingly, the §102 rejections of claims 1 and 3 are improper and must be withdrawn.

35 U.S.C. §103(a) Rejections of Claims 7-10

Claims 7-10 stand rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent Publication No. 2003/0031139 (Thilenius) in view of U.S. Patent No. 6,295,343 (Hjartarson). Independent claim 7 is directed to an ADSL circuit having an ADSL driver with two inputs and two outputs, a load coupled with the outputs of the driver via first and second impedances and an ADSL receiver with two inputs coupled through a network with the load and the outputs of the driver. Claim 7 recites that the impedances which couple the outputs of the driver to the load are **complex impedances to match the load impedance**. The Examiner argues that Thilenius discloses this claim feature. See Item 9 on p. 7 of the Office Action. Applicant respectfully disagrees.

Figures 1 and 5 in Thilenius illustrate two different circuits having echo cancellers. Each circuit has a pair of **resistors** 115a and 115b for coupling a transmitter 105 to a load 130. It is well understood in the electrical arts that the impedance of a resistor is purely resistive and not reactive. Thus, Thilenius's termination resistors 115a and 115b have only real impedance and not complex impedance as claimed. Moreover, Thilenius's termination resistors 115a and 115b do not always match the load impedance because the load impedance changes as a function of signal frequency while the termination impedance remains at a fixed resistance. See paragraphs [0024]-[26] in Thilenius. For these reasons alone, the §103 rejections of claims 7-10 are improper and must be withdrawn.

In addition, the Examiner admits that Thilenius does not disclose using transconductance amplifiers. See line 1 on p. 8 of the Office Action. To cure this shortcoming, the Examiner turns to Hjartarson and concludes that it would have been obvious to combine Hjartarson's amplifier teachings with Thilenius "to amplify weak signals received at the receivers." See lines 4-6 on p. 8 of the Office Action. However, the Office fails to satisfy its burden of establishing a *prima facie* case of obviousness. First, the proffered motivation for

combining the teachings of Hijartarson and Thilenius is conclusory and self-serving at best. There is no meaningful reason to add Hijartarson's amplifier to Thilenius's circuit for amplifying weak signals as suggested by the Examiner. Thilenius's circuit already performs this function. Specifically, paragraph [0013] in Thilenius explicitly states that incoming signals are "detected, **amplified** and processed" by receiver 110 (emphasis added).

Second, claim 7 requires more than just first and second transconductance amplifiers. The transconductance amplifiers must be coupled to other components recited in claim 7 in a particular way. For example, the inputs of the first transconductance amplifier are coupled with the first impedance and its output with one input of the driver. The inputs of the second transconductance amplifier are similarly coupled with the second impedance and its output with the other input of the driver. The Patent Office provides no evidence or reasoning whatsoever showing how Hijartarson's amplifier could be added to Thilenius's circuit as claimed.

Thilenius's circuit would be rendered inoperative if transconductance amplifiers were added to the circuit in accordance with claim 7. Thilenius's circuit already has an echo canceller (components 135a and 135b in Figure 1 and component 550 in Figure 5). Adding transconductance amplifiers to Thilenius's circuit in accordance with claim 7 would interfere with the operation of the echo canceller already used by Thilenius, possibly rendering Thilenius's circuit inoperable for its intended purpose.

References taken in combination that yield a "seemingly inoperative device" teach away from the combination, and cannot serve to create a *prima facie* case of obviousness. *McGinley v. Franklin Sports Inc.*, 262 F.3d 1339, 60 USPQ2d 1001, 1010 (Fed. Cir. 1984). In the present case, modifying Thilenius's circuit with transconductance amplifiers as suggested by the Patent Office would render Thilenius's circuit inoperable. Accordingly, Hijartarson and Thilenius taken in combination teach away from the present claimed invention. Moreover, Thilenius explicitly extols the benefits of using passive elements such as capacitors and resistors for echo

cancellation as opposed to active components. See paragraph [0045] in Thilenius. Thus, Thilenius itself teaches away from active echo cancellers such as the transconductance amplifiers used in Applicant's invention.

For the reasons stated above, Thilenius and Hjjartarson, taken alone or in combination, fail to teach or suggest many of the features recited in claim 7. Accordingly, the §103 rejections of claims 7-10 are improper and must be withdrawn.

#### 35 U.S.C. §103(a) Rejections of Claims 2 and 4-6

Claims 2 and 4-6 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Stewart in view of Thilenius. Claims 2 and 4-6 are patentable at least for the same reasons as claims 1 and 3 described above. Accordingly, the §103 rejections of claims 2 and 4-6 are improper and must be withdrawn.

#### Drawings

The drawings are objected to because they do not provide legends explaining the reference numerals. However, each element shown in the Figures is adequately described in the specification. Accordingly, Applicants see no reason to amend the drawings to include legends.

#### Double Patenting Rejection

Applicant respectfully requests the Examiner to hold the provisional obviousness-type double-patenting rejection in abeyance until the scope of any allowed claims is known. Applicant will file a terminal disclaimer at that point if still warranted.

Claim Objections

The objections to claims 1-2, 6 and 10 should now be moot in view of the claim amendments made herein. Accordingly, Applicant respectfully requests withdrawal of all claim objections.

Conclusion

In view of the amendments and remarks made herein, Applicant respectfully submits that the present application is now in condition for immediate allowance. Action to that affect is respectfully requested. The Examiner is encouraged to contact Applicants' attorney at (919)-854-1844 if any outstanding matters can be readily addressed by a phone call.

Respectfully submitted,

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